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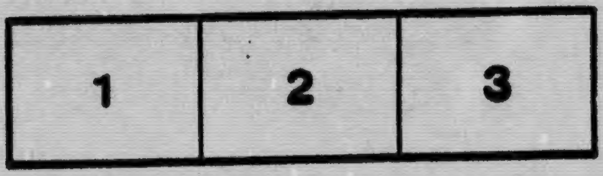

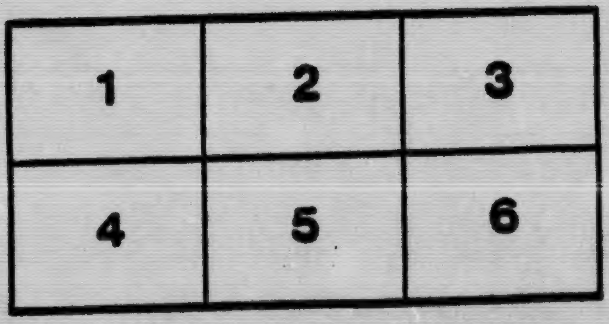

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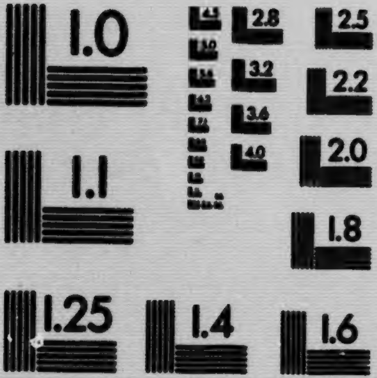

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1/ British Columbia

7/ BUREAU OF PROVINCIAL INFORMATION.

3/ Bulletin #1

4/ SUPPLEMENTARY BULLETIN NO. 1.

(SECOND EDITION.)

5/ BUSH LANDS IN BRITISH COLUMBIA,

—BY—

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CANADA.

THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

Printed by authority of the Legislative Assembly.

VICTORIA, B. C.:
Printed by RICHARD WOLFENDEN, I.S.O., V.D., Printer to the King's Most Excellent Majesty.
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BUSH LANDS IN BRITISH COLUMBIA.

IN the Lower Fraser Valley and Coast Districts of British Columbia there is practically no naturally clear, open land except lands which flood every year, which are usually covered with a rank growth of grass (either broad leafed swamp grass, blue-joint or red-top), or consist of swamps more or less peaty in character, requiring ditching and under-draining, and often also some light clearing. Land which does not flood and is not swampy is invariably timbered, the timber being scattered first growth fir and cedar, 3 to 4 feet in diameter, groves of second growth fir, 12 inches to 24 inches in diameter, mixed all through with alder, maple, cherry, birch and crab-apple, with patches of vine maple, willow and hazel, berry bushes, rose bushes and hardhack (in the wet places), with occasional fir and cedar logs scattered through the whole, at first sight presenting a pretty hard looking tangle. This represents in a general way the average character of the timbered land of the Lower Fraser Valley and Coast Districts, none of which requires irrigation.

In the interior districts are large areas of open range land covered with bunch and other similar nutritious grasses and almost invariably requiring irrigation. There are also large areas timbered, almost entirely with the coniferous woods, chiefly fir and pine, with no underbrush, the trees being fairly large, from 2 to 4 feet in diameter. Some of this land requires irrigation, although there are portions of it which will produce grain and other crops with the natural moisture. There are also in most of the interior districts patches of bottom land timbered with small willow, cottonwood, etc., etc., and with very few large trees, which do not require irrigation.

The various clearing operations described herein will apply to any of the timbered districts of the Province, although they are written more particularly with reference to the Coast and Lower Fraser Valley Districts and to those parts of the Province lying to the west of the Cascade Mountains, as these districts are the ones wherein the clearing problem assumes most prominence.

It should, however, be distinctly understood that the operations described are not intended to apply to timbered lands which would come under the head of timber limits, as the timber on such lands could not be cleared off for farming at any price which would make it commercially profitable, even if the character of the land when cleared was suitable for farming, which, often, it is not.

The character of the soil of the average timbered uplands of the Lower Fraser Valley and Coast Districts is a good clay loam, free from gravel or stones except perhaps in odd spots, no rock, more or less rolling as to surface, with wet bottoms and occasional creeks running through. There is, however, a great variety of soil in this district, running all the way from a heavy alluvial clay to a light sandy or gravelly loam. The soil in the interior valleys varies also very greatly in different districts, and soil suitable for almost any kind of crop desired can be obtained.

When and How to Begin.

The settler intending to take up and clear bush land in this Province should arrive here between March 1st and June 1st, as after the latter date there is no time to do more than one month's chopping before the burning season begins, and although chopping, or slashing, as it is commonly called, can be done at any time of the year before April 1st, it is not advisable. Arriving here in March leaves the newcomer a month in which to select his land, as the sap in the deciduous trees has not commenced to run, and trees of this class, such as vine maple, willow, hazel and, to some extent, also alder, will sprout much stronger if cut when the sap is down than when it is running freely, or when the tree or bush is in full leaf. Probably the best time for chopping is from the middle of May to the middle of July, as the trees, being in full leaf, burn easily and clean, and the windrows, or brush heaps, have ample time to dry out before the burning season. Fir, cedar and the other coniferous trees can be cut any time and they will not sprout, and as the leaves or needles are green the year round there is always enough small dried foliage to ensure a clean burn.

I cannot too strongly emphasise the vital importance in land clearing of only doing just that kind of work which is most suitable for the particular time of the year; more time, money and labour has been wasted in clearing land from not carefully studying this question than from any other cause. Another very important thing is always to follow the regular rotation of the different operations of land clearing—as a proper rotation of crops is essential to successful farming, so is it equally important in successful land clearing to observe a proper rotation of the different clearing operations. This will be explained in greater detail later on.

Another important factor in clearing land is never to chop and burn more bush in one year than you can afford to pick and *"brand up" the following fall or winter, or at least before you chop any more.

Golden Rules.

These three rules are the foundation upon which cheap clearing is built, and should be carved above the doorway of every settler's cabin in a bush country. To put them briefly:—

1st.—Always do that kind of work most suitable to the season of the year.
2nd.—Follow a regular rotation in all clearing operations.
3rd.—Never chop in one year more than you can brand up before the next chopping season comes round.

One great advantage in following these rules is that it gives variety to the work and it never gets monotonous. Given well chosen land and it is safe to say that by strictly following the above three rules the cost of land clearing can be reduced to one-third of what it will cost by disregarding them. In fact, a man entirely unused to land clearing, who uses his head as well as his arms, will clear land cheaper than the man born with an axe in his hand, who only uses the hand and the axe.

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* "Brand up" to gather together into heaps the charred or partly burned sticks, small logs, branches, etc., etc., left after burning.

As to tools: All that is wanted the first year is a double-bitted axe, if you know how to use one, or a single-bitted one if you are only learning, (get a light axe with a blade not too wide and wrap some light fence wire around the handle close to the head—this saves many a broken handle). If there is no clearing on your place to start with, buy a small sized wall tent and about 100 feet sup. of 12 x 1 inch boards for your camp. Set up your tent on the south or east of your land (as that is the side you should start to chop first), and on the roadside not too far from water. Always start to clear, if possible, on the south side of your land first. This does not make very much difference the first year, but it makes a big difference every year afterwards, because after you have got a clearing once made, your subsequent clearings dry out quicker if they are open to the south.

The first thing to be considered is what should be chopped first; to chop down the whole bush, big and little, is a heavy task, a slow one, and nearly always spoils the clearing. The object should be to burn as little timber as possible, as the larger trees are valuable, or will be in the near future, at least to the extent of paying to take them away; therefore, leave all the first growth fir and cedar (the standing tree takes up no more room than the stump will occupy after the tree is chopped down, and in a very short time timber of this character will not only pay to remove but give a profit sufficient to pay for taking out the stump.) Another reason for leaving these big trees is that they are coniferous trees (that is, fir, cedar and hemlock), and if you burn them on the ground the fire is so hot that you burn the vegetable humus out of the soil and get none of the fertilising ashes left by deciduous trees to take its place. Still another advantage of leaving the very big trees is, that when all the other timber is burnt off they are more exposed to the wind, and often during the winter they will blow over and bring up the stump, thus saving the cost of stumping later on. The second growth fir, one to two feet in diameter, makes good cord-wood, for which there is a ready sale to the steamboats at $2.25 a cord, a price which about pays for the chopping and hauling, besides which, it pays to take this away, as you save the burning and logging and do not injure the land. Deducting the heavy timber and second growth coniferous woods, which practically cost nothing to get rid of, as wages are made while clearing them, there are only the fir and cedar saplings and the deciduous trees left, the latter of which it is advantageous to chop and burn (even the heavy ones, of which there will be very few over 12 inches thick), as they make a lot of ashes, which enrich the soil and make a fine seed bed.

In chopping this kind of bush the time of the year should be considered; the best time to burn is about the middle of August; good fires are sometimes got a month earlier or a month later, but August 15th is a good average. During a dry summer bush will burn two weeks after it is chopped (that is if it is well piled), so it is a good plan to have all your chopping finished by August 1st if possible, or even a little earlier. Alder is almost the only deciduous tree which can be chopped when the sap is down and the leaves are off (that is in winter), without much danger of its sprouting, so that it is better not to start chopping until about April 1st, by which time the trees are all bursting into leaf; the more leaves there are when the trees are cut the better will be the fire, and remember that a good burn is the biggest half of the battle. If the brush is well piled and burnt at the right time the fire ought to sweep completely over the ground and burn everything up clean (except a few of the bigger tree trunks), leaving the ground quite bare except for a fine covering of ashes. It is better to chop only five acres and pile everything up thoroughly, than chop 10 acres and do it carelessly, as the work of branding up after the fire in the former case is trifling, but if a good burn is not obtained the picking up is sometimes a big business.

If the chopping is done by contract instead of personally, it always pays to give a dollar or two an acre more and get an A1 job, than get it done cheaply and badly piled. Spend a dollar extra in money or time on the chopping and piling, and save two dollars on the picking up.

Advice as to Chopping.

Here are a few hints as to chopping :—

Pile the brush and trees in continuous rows (called windrows), not in heaps, and if there is standing timber on the south side of the clearing, as there probably will be the first year, let the windrows start at the standing timber and run north for about eight rods or thereabouts. Do not build a pile parallel to the standing timber, as it will never dry out properly. When there is once an opening to the south of the clearing it is better to let the piles run east and west, as they dry out better.

Do not pile any brush on logs; leave the fallen logs clear, for a cedar log would probably burn up, and all the cedar logs are wanted for fencing, draining and buildings, and a fir log is prevented from drying out if brush is piled upon it and, more important still, brush piled over a big log leaves a hollow alongside the log under the brush, and the brush does not burn well.

All deciduous trees (and particularly hazel, vine maple and willow three inches in diameter or less) should be cut right into the ground. The reason for this is that they are sure to sprout more or less the following spring, and if there is six or eight inches of a sharp stump sticking up the cattle cannot brouse on the young shoots, but if cut into the ground the cattle will keep the shoots trimmed down and they will nearly all be killed out by the following fall. Fir, cedar or hemlock seedlings need not be cut so close, as they do not sprout; in fact, it is better to leave them six or eight inches long, as they are more readily knocked out by the cattle tramping among them. Anything above three inches diameter should be cut "stump high," about 2½ feet. Do not cut anything above twelve inches in diameter (as above that thickness will make good cord-wood), except alder or maple, which should be cut along with the brush. If you are going to live on the place it is a good plan to limb the trunks of the larger alders and maples, cut them in convenient lengths and, instead of piling them on the brush pile, leave them on the ground between the piles, and when the chopping is finished and before you start to burn, haul these logs out of the way, cut them into four-foot lengths and split them for cord-wood for your own use. They should not be allowed to lie on the ground all summer without splitting, or they will be dozey by the fall.

It is a good plan to leave a few of the larger trees that are to be burnt until the last, and then chop them so that they will fall over your brush piles. This compacts the piles and leaves the larger trees on the top, where they have the best chance to dry out and burn, but be careful not to leave them lying *across* the piles, and always limb them and cut them into two or three lengths, so that they lie close and snug.

Do not chop anything after August 1st at the latest, but a week or two before burning take a light scythe and mow the ferns which will probably have sprung up between the brush piles. These dry out in a few days and help the fires to run. The clearing will now be in apple pie order for a good burn.

When to Burn.

In writing these notes on land clearing I am assuming that the settler is devoting most of his time to his clearing and am giving him the best times to do each kind of work, but the only time which is absolutely essential to keep to is the burning, which must be done about the latter half of August, if at all possible. If the settler wants to work out he can do his chopping any time between March 1st and August 1st, and unless he intends to work on his place all winter he will probably find that he will chop in two or two and one-half months as much as he can conveniently finish up the following winter. The average man on the average bush land should chop and pile ten to fifteen acres in that time, which will give him a first-class start the following year in either poultry or small fruits, or even dairying in a small way, though it would hardly be advisable to try to stump and plough more than four or five acres for two or even three years after. By that time, if he continues this course, he will have made a very big hole in the bush of his twenty or forty-acre farm.

Advantages of Heavy Timber.

It should be borne in mind that up to a certain point heavy timber is, apart from the stumping, often the cheapest to clear, as anything over twelve inches in diameter would not be chopped, and as a rule the lighter the bush the thicker it is, and it is the thickness more than the size that increases the cost—this, however, is often compensated for by the soil being better. Where there is heavier timber it means more cord-wood, which costs practically nothing to clear, as wages are made while cutting it. This would, of course, apply to land within such a distance from the market as would pay to haul, say two or three miles, although every year as the price of cord-wood rises, as it unquestionably will, the distance for profitable hauling gets longer. Where the distance is too far to haul cord-wood the extra cost of clearing is partly compensated for by the cheaper price of land.

If land is bought too far from a cord-wood market to make cord-wood profitable, it is better to buy rather more land, say forty to eighty acres, and clear only twenty acres as a beginning. This twenty acres will cost more to clear than the land so far discussed, but in a few years the timber will probably become so valuable as to more than compensate. In fact, there is not the slightest doubt but that the history of Ontario will repeat itself here, and before long the timber on many farms will be more valuable than the land would be were the timber taken off.

If the burning is done about the middle of August there is usually from four to six weeks of dry, hot weather before the rain comes; it is a good plan to take a mattock and go over the burnt ground, roughly splitting up any large decayed fir logs lying in the clearing. These logs are sometimes too rotten to make cord-wood, and being water soaked will not burn until dried out. The first fire, as a rule, only burns off the moss and the projecting ends and loose pieces, but two weeks of hot sun after they have been roughly split up makes a great change. Two or three days pulling about with a mattock is usually all that will be needed. As soon as they are dry enough put a spoonful of coal oil here and there, and thus hundreds of little fires can be started in a day in these old logs, which will smoulder away, often for weeks, and when the rain finally comes it is surprising what a difference this will have made in the clearing. They will not be all burnt up, but a good many of them will be, and they will all be much reduced in size. This rotten wood will smoulder like peat and dry up as it goes along.

Seeding the Cleared Land.

Seeding down the clearing comes next, and this is one of the most important things in all the clearing operations, as on it depends very largely the profits for the next three years. The new crop of grass seeds is not yet in the hands of the dealers, and their stocks at this time of the year (August) are often low; so if buying the seed is put off until the land is ready, there may be difficulty in getting it, and seeding must be done almost immediately the ashes of the first fire are cool, and in any case before the fall rains come. (If a heavy rain falls on the ashes before seeding, it forms when it dries a thin skin, which prevents many of the seeds germinating and leaves them exposed to the birds.) The grass or clover seeds should, therefore, be bought in May or June. If they are sown, say, about the end of August or middle of September, the clearing will be green within a week after the first rain. Many people think it better to put off sowing the seed until the following spring, as they think the young clover is liable to be killed out by frost in the winter; the writer has tried it both ways and unhesitatingly says—seed in the early fall. There is no frost here to hurt clover when it is once rooted, and although the young clover may be killed out in spots if there happens to be a particularly severe winter (that is, severe for British Columbia), this will very rarely happen, and if the seed gets a good start in the fall it will mean a good pasture the next year, while if the seeding is delayed till spring the pasture is nowhere near as good. The kind of seed used will depend to some extent on the kind of soil and how long it is intended to wait before ploughing. The best pasture is a mixture of 5 lbs. timothy, 2 lbs. orchard grass, 2 lbs. small white clover, 5 lbs. medium red clover, and about 2 lbs. rye grass or cocksfoot; but in practice, and remembering that when the land is ploughed the clover makes a good manure while the grasses do not amount to much in this respect, it is found that about 7 lbs. timothy, 2 lbs. small white clover and about 8 lbs. medium red clover do the best. In low, damp places put most of the timothy and none of the white small clover, and on the higher and drier ground put very little timothy and all the white clover; better use too much seed rather than too little. If it is intended to use the land more than three years for pasture before stumping and ploughing, it is as well to leave out the red clover entirely, using more timothy seed and a little cocksfoot or orchard grass, as the red clover will run out in three or four years under ordinary circumstances and weeds take its place. The second year's chopping, for this reason, is nearly always better without the clover. Be sure and get clean seed, the very best is none too good; and while on this subject it might not be out of place to remind the new settler that the highest standard of excellence should always be aimed at. Try and do every part of the clearing, fencing, buildings, drainage, etc., right up to the "top notch," even if it does cost a dollar or two more or take a little longer; do it right once and it will never have to be done over again. The best is always the cheapest in the long run.

Doing Things Thoroughly.

Many people say, "this will do temporarily; by and bye I will fix it," but "by and bye" never comes, and in nine cases out of ten that man goes on patching and repairing to the end of the chapter, and never has a decent farm or good fence. He will often lose in one year the cost of a new fence through his neighbour's cattle getting in or his own cattle getting out.

When the seeding is finished and the rotten logs are broken up and burnt, the next thing is to pick and brand up the small logs and charred ends left from the fire. Two or three months' chopping in the spring, if you have a good burn in August, should not mean more that three or four weeks' branding up in the fall, and this would include sawing all fir logs into twelve-foot lengths. Wherever possible, these small logs and loose ends should be piled against a stump or rotten log. Chop everything into lengths that can be easily handled; use the heaviest pieces as a foundation for the pile; pack them in close and lay all the sticks parallel; do not have any cross sticks, but pile them as closely as possible and top off with any old roots and rubbish that are loose and can be easily pulled up by hand. Don't waste time pulling and straining at anything which does not come easily. What is fast now will be loose next year and will probably plough out by the time you are ready to plough. Any small rotten fir logs which were too wet to burn in September can also be piled, as this is a very easy way to get rid of them. All big fir logs of whatever degree of rottenness or soundness, if not previously broken up with a mattock, should be sawn into twelve foot lengths; this is more conveniently done now than later on, and sawn into these lengths they can easily be handled by a team or cant-hooks when they are finally logged up, or if sound enough they are the right length to re-saw for cordwood. Some people also saw up the cedar logs at the same time, but in practice it is better to leave them until it is decided what they are to be used for—rails, posts, drain boards, buildings, shingle bolts, shakes, etc., etc.

Utility of Cedar.

On a good deal of land in the Lower Fraser Valley the cedar logs and dead standing cedars are very plentiful and are a most valuable asset, as they can not only be used in all building operations, but if there is a surplus, as there often is, they can be made into shingle bolts and sold for from $3.50 to $4 per cord, a figure which will stand a good four-mile haul or even more.

Destroying Bracken.

Within two weeks after the August fires are out the young bracken fern will begin to show up in the clearing. As soon as the fronds of this fern are fully open it is as well to spend two or three days in mowing them, or knocking them off with a stout switch, as although this is not essential, it greatly reduces the size and number of the next year's fern crop, and a day spent at this, the same fall that you have your first burn, will save three or four days next year. This bracken, or fern as it is called here, invariably grows thickly in most new clearings, and if neglected for two or three years will soon choke out the pasture. These ferns in old neglected bush clearings sometimes grow to a height of twelve feet, and so thickly it is difficult to force a way through them, but if they are cut regularly they are soon killed out. Various remedies have been tried for killing out ferns, but the only sure way is to cut them. They should be cut at least twice and if possible three times the first year, twice the second year and once the third year; after that they will practically be all gone, or so thinned out and reduced in size as to be no detriment. They should always be cut a week or so after the fronds are fully open, as by that time the fern has exhausted its root, and will have to gather up fresh strength from the leaves or fronds for next year's growth, and if they are cut at this stage it kills out that part of the root. Cutting before the fronds are open causes them to bleed, and weakens the root, and if they were cut every three weeks it is probable that one year's cutting would about kill them out, but during the summer it is hard to find time to do this, and even with only two cuttings the first year they do not injure the pasture to any extent afterwards, even if not cut at all. They are very easily cut with a light scythe or even knocked off with a stick, and every cutting they get smaller and fewer to a very marked degree. A heavy growth of big ferns is a proof of good soil.

Second Year's Operations.

If the new settler does not intend to work out but can afford to devote his whole time to clearing up his land, he will find that after the odds and ends from the burning are branded up, and the cord-wood cut, there will probably be some months of spare time before it is advisable to begin chopping for the second year's burn. This period can be profitably used in getting out posts, sills, plates, rafters and other timbers for buildings, and in sawing up and splitting the cedar logs for fence posts, rails, drain and fence boards, etc., etc. By doing this work now it will not interfere with other work later on during the following summer, and which has to be done at a particular time. It would be no use giving sizes of timbers for building purposes, as these would depend on size and class of building, but the size of posts, rails and boards for fences and ditches most suitable to this country are standards, and need not be deviated from except in special cases.

Fencing.

A legal fence is 4 feet 9 inches high above the ground; the posts should be cut 7 feet 6 inches to 8 feet long if they are to be driven, and about 7 feet 6 inches if set in a dug post-hole. If they are to be driven the pointed end should be tapering, not less than fifteen inches long, as they drive much more easily if well pointed. A post to be driven should be about 6 x 6 inches; if to be set in a post-hole in clay land, not less than 8 x 8 inches; or if in sandy or gravelly land, 10 x 10 inches will make a much more lasting job. In driving posts, always bevel off the edges of the driving end with the axe; the fibers of the wood are then crushed by the first blow and the post will not be so liable to split. It is a good plan when driving posts, if the clay is at all dry or hard, to take out one spading first and put a cup of water in the hole before setting the post; it will drive very much easier.

Fences of boards and wires are the most serviceable and look the best, but when a man's means are small and he has lots of cedar, perhaps the best all round fence is a straight one of posts and rails. As a rule, the posts are set 12 feet centre to centre, but if there is good splitting cedar, make them 16-foot centres, as this well take a 16-foot rail, which can afterwards, if it is replaced with a board fence, be worked up into two posts. This length of rail, 16 feet, is also the right length for a snake fence, though the latter should never be used except temporarily, as it takes up a lot of room and harbours all kinds of weeds and rubbish.

In laying out a post and rail fence, it is a good plan to build it with a very slight zigzag, as the panels are then all braced against one another, which adds to the strength, and being a somewhat top-heavy fence, all the strength which can be got is needed. The way this is done is to set the posts in a straight line; use heavy posts and dig holes (do not use driven posts), then lay the bottom rail so as to be alternately on one side of the post and on the other side of the next one, and so on, the full length of fence. Then take light posts well sharpened and drive them on the other side of the rail. (See Figure 1).

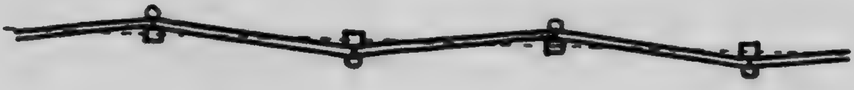

FIG 1 PLAN OF POST AND RAIL FENCE

The square posts are those first planted, and the round ones are driven. They are not really round and are only shown so in order to distinguish them from the heavy posts set first. This fence is practically straight and looks straight, but is much stronger than if it was really straight.

The rails should be all exactly the same length with square ends. Lay the rails one above the other parallel, and with butt-joints, with a 4-inch or 6-inch distance piece about 12 inches long wedged between the two posts and between each pair of rails. (See Fig. 2). This is very much better than the old way of making lap joints with the rails; they look neater and the rails go a little farther. When all the rails are laid bore two holes through the heavy posts at the top, one hole to go through the end of each rail, and thread a piece of heavy telegraph wire through them and tie it round the smaller driven post. This will prevent the posts from spreading. Wrap a piece of similar wire round both posts at the bottom, but without holes. It used to be thought that wiring them on the top only was sufficient,

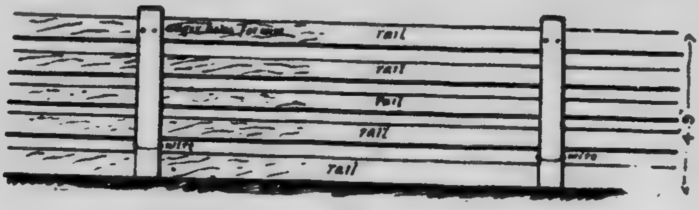

FIG 2 ELEVATION, POST & RAIL FENCE

but experience has shown that to make a permanent fence that will not want repairing every three years or so it is necessary to wire them on the bottom also.

If first class free splitting cedar is plentiful, boards can be split 12 feet long, 1 inch thick, and from 10 inches to 12 inches wide, and nailed on the post the same as the boards of an ordinary post and board fence, either with or without barbed wire. The posts are usually set 12 feet centres. This is not quite so strong as a board fence of sawn fir boards, but it makes a good fence, particularly for cross fencing between fields, and is quickly and easily repaired and much cheaper. Use wire nails either for cedar or fir boards; they last twice as long. If split cedar boards are used it is better to use the boards on the bottom only for hog proofing and wire on the upper part of the fence. If cedar boards are used throughout they are apt to get split, owing to people climbing over them, although apart from this a good fence can be made from cedar boards alone. In practice it is found that 4 feet 6 inches is high enough for cross fences. (See Fig. 3.)

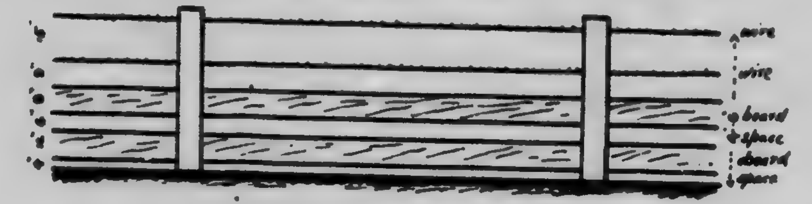

Fig 3 Cedar Board & Wire Fence.

If it is intended to put up a post and board, or post, wire and board fence, then set heavy posts 16 feet centres, and after your lower boards are nailed on, drive light posts (sharpened) half-way between, so as to give a post every eight feet. There are various combinations of boards and wires, but a very serviceable and cheap one is made by using an 8-inch board four inches from the ground, then a 6-inch board about 5 inches above it, then three barbed wires; sometimes a 6-inch board is substituted for the middle wire, in which case a 6-inch board can be used on the bottom instead of an 8-inch board. The bottom board being fir should not touch the ground, otherwise it will rot. Fir boards more than 8 inches wide are apt to warp and draw the nails; split cedar boards do not warp and can be made 12 inches wide. If 6-inch fir boards are used get them, if possible, 24 feet long, as they are then nailed to three posts and make a stronger fence; use not less than 3½-inch wire nails, two nails to each board wherever it touches a post, and three at the ends if over six inches wide. If you do not use the boards as soon as they arrive, pile them neatly with small slats of split cedar between them, so as to prevent warping and twisting. Where fir boards are used, always saw off the top of the post to a slope after the fence is completed, so as to shed the rain on the opposite side of the post to the boards. Split cedar boards are the cheapest, that is of really good splitting cedar; galvanized barbed wire is the next, and fir sawn boards are the most costly, though many people think they make the best fence and look the best. For dairying and small fruits, hogs and sheep, any of the above fences are equally good, but if you are keeping high grade horses it is as well to use either a post and rail fence or a post and board fence with no barbed wire.

In a board and wire fence on the road side, where light driven posts alternate with heavy posts, it is a good plan to plant alongside or behind the light driven posts a young tree of some ornamental kind, say Lombardy poplar, maple or walnut, or some of the thorn or crab-apple varities; they cost little or nothing to plant and add very much to the appearance of the farm, and by the time the light post has rotted out you have a living tree to take its place. These trees are not needed as a wind brake, but afford shade for cattle.

While on the subject of fencing it should not be forgotten that at the end of the first year's clearing there will probably be only one boundary permanently cleared, and that is that part of the clearing fronting on the road; a permanent fence, either post, board and wire, or a straight post and rail fence, can be built on this. The same kind of fence can be built on the side lines if your neighbour has also cleared up to the line, but on the back line a temporary snake fence of 16-foot rails should be built. The next year, if the clearing is extended, it may be necessary to take this down before burning, and in any case after the burning it will want moving, so as to include the new clearing. It is as well not to build any permanent fencing for a year or two except on your boundaries, until you have a good amount of clearing done and can get an idea as to how the fields are to be divided.

Hints as to Cord-Wood.

A new settler on a bush clearing is hardly likely to have a team and waggon the first year, so he will have to depend on his neighbours for hauling the cord-wood. This is usually done in the early summer and should start as soon as the roads are dry enough to stand heavy loads. In making a contract for this there should always be a stipulation that all the wood shall be removed from the clearing by July 10th at the latest, and delivered on the river bank, or wherever the cord-wood market is, not later than September 15th, otherwise it will have to be left to the following year, when it will have slightly deteriorated. The reason for having it removed from the clearing by July 15th is that until it is removed it is not safe to burn any of the log heaps from last year's clearing, and it is often convenient to be able to burn these at any time the weather is suitable and before it gets too dry, as, if left too late, the fire may run over parts of the newly seeded ground. In cutting this cord-wood it should all be cut and split the winter or spring following the burning and hauled the following summer. Saw it into 4-foot lengths and split up everything that will make cord-wood. Old fir logs, if not too dozey, and all the second growth fir, hemlock and spruce, or even a few big cottonwoods or alder will not be amiss. In the case of green trees, carefully pile all the branches and tops in one big heap over an old stump, if possible. The cord-wood should be neatly piled in piles 4 feet high and 8, 12 or 16 or 32 feet long, so as to make it easy to measure. Don't pile it in little promiscuous heaps; the man who is going to haul it likes to know how many cords he is going to haul. A man and team hauling cord-wood are considered to be worth $4 a day of ten hours, and it will probably cost about $1 per cord to haul it to the steamboat landing. This includes making rough roads through the clearing.

A cord of wood is 8 feet long and 4 feet high, the sticks of wood themselves being 4 feet long, so that each cord of wood contains 128 cubic feet. When wood is piled on the river bank for delivery to the steamboats, it is usually put up in three-cord piles, each pile being 16 feet long by 6 feet high; with the wood being 4 feet long, this makes 384 cubic feet to each pile, or three cords.

The average ten acres will give from fifty to eighty cords from the old logs and second growth firs. A good deal of timbered land will give no cord-wood at all, and again there are other blocks that will give from 100 to 120 cords, or even more, to the ten acres.

If the land which is being cleared is outside of what might be called the cord-wood or shingle bolt belt, say more than three and one-half miles from the market or shipping point, it would be as well only to cut down the second growth fir over an area as large as would be wanted for hay on a twenty-acre farm, say five acres, and on a forty-acre farm say ten acres. If it is intended to dairy, speaking generally, about three times as much rough pasture is wanted as hay land. Five acres of good land, well cleared and in good order, will give from fifteen to twenty tons of timothy or clover hay, which is all that would be wanted for say eight head of cattle during the winter. If you are not milking, cattle will pasture out more or less nearly all winter.

Burning the Stumps.

On land too far from the river to sell cord-wood or shingle bolts it will be necessary to burn everything on the land you are going to use for hay. On the balance of the land it is better not to cut any standing coniferous timber over eighteen inches thick, but seed down for pasture, using a much larger proportion of small white clover and orchard grass, and leave out the medium red clover entirely. The system of clearing land which is going to be used for hay, and on which you will burn all the standing timber, is somewhat different from the system used on land where cord-wood is cut. The great mistake many settlers have made is in cutting the timber down and burning it, simply to get rid of it, forgetting that they are destroying a valuable aid in getting rid of the stumps. If cord-wood can be made profitably out of this timber, all the better, but if not, then use the timber for burning out the stumps. Probably the cheapest way to get these out is by powder; but where there is a certain amount of good wood to burn anyway, it is better by far to burn it to the best advantage, and the best possible way to do this is to burn out the first growth fir stumps with it. To do this it is necessary to dig round the stump a little so as to expose at least one of the roots and make a way for the air to circulate under it. Pile up the logs and start the fire. If this is kept going for two days there will be very little of the stump left by the end of that time. One man can attend to half a dozen such fires in a day. The great point in burning large stumps is to have an opening under some part of the stump so as to allow a thorough draft. The second growth timber which you are going to burn for this purpose should be cut in six-foot lengths and split in two, so as to dry out (but not too dry, as it would burn too fast). Get an opening under the stump or one of the main roots, and then pile round it your newly split second growth timber well filled in with rotten logs. First growth fir stumps can be burnt in the winter if you have some dry wood to start with. It takes a little more digging, but there is so much pitch or gum in the roots that when the fire is once started it will go on burning all night, even in a snow-storm, so long as the fire has not burnt down to one log. The hardest things to burn are rotten logs, but these can be easily got rid of by piling them on the stump fires—it should be so managed that when the stumps are burnt out there are no rotten logs left.

Killing the Sprouts.

The clearing is now one year advanced; it is chopped, burnt, seeded, branded up, fenced and the cord-wood cut, stacked and ready for hauling next summer. The process of clearing so far described should be repeated every year, till all the farm is cleared to the same degree and in pasture.

The summer following the first chopping the ferns should be cut three times if possible, as before mentioned. It will be found that while the first cutting will take about a week (for ten acres), the third cutting will not take over a day. About August, after the second clearing is chopped and before it is burnt, there should be about two weeks spare time. Get a small camping axe (75 cents), with a short handle about a foot long, and spend a few days in cutting out the willow, hazel and vine maple sprouts growing up from the roots of last year's clearing. Do not be satisfied with pruning them off, as a good many may grow again, but knock them off at the root. There is no need to spend much time over this, as a good many of the smaller ones will be nibbed off by the cattle or sheep and others will die out in any case the second year, but what you do chop or knock off, treat thoroughly.

Between Season Work.

It is a good plan during the time of chopping the next ten acres, whenever there is an extra warm day, to burn off a few piles of the "branding up" heaps (taking care not to burn any of the cord-wood). It lends a little variety to the work of chopping. These branding up heaps can be burnt almost any time between April and September. When the fire is out pick up any fragments left and pile them on the nearest unburnt heap and immediately seed down the burnt spot. If rain falls before the seed is sown, drag a handful of brush (two or three cedar branches) over the ashes after the sowing. This will cover them and give them a good start.

When you have got all the "branding up" piles, and the piles of branches from the trees which have been made into cord-wood, burnt, and the cord-wood hauled away, the clearing is finished as far as the pasture stage is concerned; that is, there is nothing further to do to it so long as it is only going to be used for pasture; the bulk of the old logs will have been used up, the fir for cord-wood, and the cedar for fencing, buildings, etc.; all that will be left will be the stumps and a few fir logs too rotten for cord-wood. The following year the pasture will be first-class, and as good as could be wished. Last year, by the first of June, the writer had clover over two feet high on a piece of clearing at the same stage as that described above, and it was very thick. If it had been cut for hay on that date it would have gone two and one-half tons to the acre, at least.

If it is the intention to stump and break up the land as soon as the stumps are ripe, then the following winter it would be as well to spend a few weeks in preliminary work, which will consist of a few under-drains and logging off the old rotten logs. The draining should be done first, as it dries out the wet places and helps the rotten logs to dry out too. Most of those that are too rotten to handle with a team can be burnt off without handling at all during August, by the coal oil method before described. The use of a bottle of coal oil and a bunch of matches, or a gum stick torch, will greatly reduce the time required for burning the brush heaps and branding up piles; in fact, 10 cents worth of coal oil will often save a day or even two days' work, as no kindling is required to start the fires, a small handful of leaves or dry ferns only. It is by using all these little time-saving devices that the cost of clearing is so greatly lessened.

Drains and Ditches.

On the average bush land very little draining is required, but as it is generally rolling there will probably be some few swales or wet places, which will be none the worse of a little ditching. As a rule, however, no systematic draining is required. A careful survey or prospecting should be made not only of the present clearing, but of the whole farm, to see which is the lowest place, or the natural outlet for the drainage. If this is not readily ascertainable, it is better to put off all the draining until the whole block is cleared for pasture, as a general bird's-eye view can then be got to very much better advantage. If the outlet is in an uncleared part of the farm, then put it off till that part is cleared, as the ditching is done much more cheaply when the land is chopped and burnt; if, however, the outlet is in a part already cleared, start to dig a ditch about two feet to two and one-half feet deep, and twelve to eighteen inches wide (depending upon amount of water to be carried in the winter), and following the hollow or wet place you want to drain. If this wet swale is much over four rods wide, it is better to dig a ditch on each side of it at the foot of the rising ground and let these two ditches come together again where the swale narrows. Always remember the ditch or underdrain is being dug to carry the winter's water, not the summer's. A creek or wet place that looks little or nothing in the summer may be quite an imposing stream in the winter.

Dig the ditch or drain straight; on no account ever put in any curves; it is almost impossible to box these for underdrains if they are curved; use two sticks and a piece of light wire to set it out with; do not trust to the eye. If the swale or low place to be drained is not straight (and it is very unlikely that it will be), then zig-zag the ditch to fit its curves; make sharp clear-cut angles at the bend of the ditch; never curve them on any account.

On level ground, in alluvial clay, the underdrains should be three feet deep, and in peaty land or black muck three feet six inches deep, but in upland clay or clay loam two feet six inches is deep enough, and often is ample; the character of the soil will determine the depth; twelve to eighteen inches wide is enough in all cases, but if the drain is to be an open ditch it should be two feet six inches to three feet six inches wide at top, and about twelve inches at bottom, with sloping sides, or if a considerable amount of water is to be carried, then wider in proportion. These ditches should always be left open for a year, or thereabouts, as it gives the land a better chance to thoroughly dry out. The best time to dig ditches is when the ground is soft, but there should not be too much water (say just enough to give a grade). Early summer or early fall is perhaps the best time, but they can often be dug to advantage in winter.

While the ditches are open and the wet places drying out is a good time to clear off and burn up all the ends of logs, loose roots and general odds and ends left from the burning and cord-wood operations. Many clearings have been spoilt and their productiveness set back for two or more years by careless or over-burning, and although it is sometimes impossible to avoid it, still by using care and judgment this evil can be minimised.

Handling Big Logs

There will probably be found occasional large fir logs too rotten for cord-wood but too sound to be broken up with a mattock. These logs often have layers of sound pitchy wood in them, but not enough to pay to make cord-wood. They often appear to be the most difficult part of the clearing, but they are in reality very easily got rid of. They should be sawn up into six-foot lengths (they were already sawn into twelve-foot lengths when the clearing was branded up) and split into large pieces about ten or twelve inches thick (much larger than cordwood) and laid back on each side of where the log was. When it is all split up, pile it back again in the place where the log originally lay, in six-foot sections, each section to be close up to the adjoining one; pile it carefully and as closely as possible, then start a fire with dry cedar in any of the sections (depending upon the direction of the wind), feed the fire with dry wood until it has caught well, and then let it go. The whole of that log will burn up clean, no matter how wet it is and no matter how bad the weather is. Of course, it is best to start the fire on a dry day, but rain or snowfall, after the fire is once started, will rarely put it out. After the log is once split, however, it should be repiled and burnt at once. Don't let it lie exposed to the rain, as it will not burn so well if the split pieces are allowed to get wet before repiling.

There is always a considerable amount of rotten wood alongside these old fir logs, which is in such small pieces as to be difficult to handle. The heat of the fire will dry these out for three or four feet on each side of the log, and the fire will usually catch and burn up all the rubbish. Very little attention is needed, and very little branding up. These large pieces are heavy to handle, and it is as well to exchange work with a neighbour for a day or two while these logs are being burnt. Always repile the log in the place where it originally lay. The reason for this is, first, that it will then burn up all the rubbish on both sides with the least handling, and secondly, because the log invariably lies in a slight depression caused by its own weight, and as the ground under the fire is sure to be badly burnt, when you come to plough and level off, this burnt spot is naturally covered up.

Log Burning.

The best system for burning the smaller logs and the roots and stumps is somewhat different; in most timbered sections there will probably be one or more gullies, or if not there are sure to be depressions with rising ground on each side. Dig out of the side of the gully about eight or ten feet from the top (or out of the rising ground at the side of the swale, as the case may be) a good sized hole about eighteen feet square with a flat floor, somewhat as if you were going to build a bank root-house. (See Fig. 4.) And in the hole dug out build a pile of logs, old roots, or anything at all that has to be burnt. The site of this burning pit should be chosen in as central and convenient a place as possible, having in view the logging, not only of what is now cleared, but what is going to be cleared next year. Sometimes two neighbours can join at one burning pit if it is dug at a point convenient to both of them. This pit may take a day or two to dig, but it is well spent time, as it saves probably weeks of work afterwards.

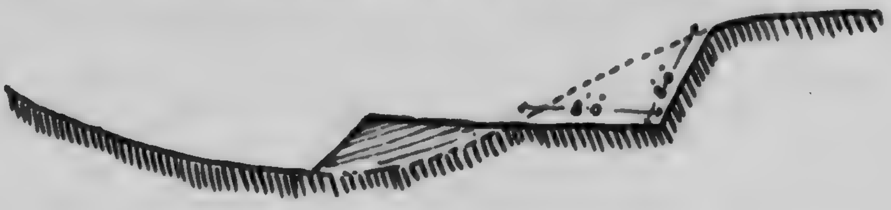

FIG 4 CROSS SECTION OF BURNING PIT.

The actual logging is best done, where possible, by two or three neighbours joining together and exchanging work; many hands make light work, and many teams make it lighter, but it is surprising, even with only two teams, how quickly the ground is cleared off. Do not start the fire now, but after the pit is once full haul everything up to the edge, or as near to it as possible, and leave it exposed to the sun to dry out for a while, and then when the logging is finished a fire can be started in the pit almost any time of the year, even in the winter if there is enough dry wood to give it a start. Every morning on the way to work, and every evening on the way from work, spend half an hour in poking up the embers of the fire and rolling over the edge of the pit a fresh supply of logs and roots. Put on the small stuff first and then roll on some of the biggest or wettest. With very little attention the fire will never go out till everything is burnt up, and there will be a good pile of ashes left which can be hauled away and spread over any bare spots on the clearing, whereas if there had been a number of log heaps scattered here and there, there would not have been enough ashes anywhere to have fertilised any one burnt spot. The same system of burning can also be applied when you come to take out the stumps, particularly the smaller ones and the second growth firs that have been cut for cordwood. This system of logging is a long stride in advance of the old method of piling in heaps and burning on the ground, as the soil, not being spoilt by over-burning, is only one of the advantages. It is much lighter work, as almost all the handling is done by teams, and it takes far less time both in getting the logs ready for burning and also in the burning itself. It is no exaggeration to say that, even allowing $4.00 a day for a team and man, the cost of logging by this system is only one-fourth of what it is in the old way. In the first place, the logs need rarely be sawn into anything less than twelve-foot lengths, and very little splitting is necessary; there is no lifting or skidding required at all, and if this lifting or skidding is done by hand, it is the heaviest and hardest work of all the clearing operations, and besides taking from two to four men. Then, again, when you have an ordinary heap of unsplit logs burnt, there is probably half of it left, and it has to be repiled and branded up, and this cannot be done until the fire is quite out and the ashes cold, which will often take two or three days. In addition, the branding up operation often has to be repeated two or three times; besides which, you can only burn unsplit log heaps in the dry weather, just at the time when you are busy with something else.

The burning pit method is largely intended to be suggestive; in practice many slight modifications will probably suggest themselves; one good plan is to blast out one of the largest fir stumps, at some central or convenient point in the clearing; do not be afraid of using plenty of powder. Use too much rather than too little; put the hole away down below all the roots, the length of a long shovel handle at least, so as to get the end of the hole well under the centre of the stump, the object being to blow out the entire stump at one blast, so that not a fragment remains in. This will also blast a very large hole in the ground, which can be used as a burning pit, and will have all the advantages described above, besides the additional one of having got rid of the stump at no more cost than digging the burning pit. You can burn all the logs and rubbish and other roots in this hole without burning the surface of your ground, exactly in the same way as is described above. After the large pieces are logged out and either piled in the hole or round the edge of it, there is often a good deal of more or less rotten stuff which is very wet. To save handling this twice, it is advisable to start the fire in the burning pit, and then when this has burned down a little, keep hauling on the small rotten pieces of wood and other wet material. This can be thrown in (no matter how wet it is), and will all burn, and by burning it now it saves re-handling later on.

If it is the intention to take out the big stumps before the ploughing is done, then it is better to take them out at this stage while the logging is going on, as there is then more material with which to burn up the stumps. In some cases, if all the logs are burnt before the big stumps are taken out, it is more difficult to burn these big stumps up after they are blasted, as it often needs some loose and smaller material to keep the fire going.

The operation of logging and burning up the logs and stumps is the bugbear of everyone clearing land, and it often deters people from starting, but if done in the way suggested above, most of the "hard work" part of it is taken out, and the time required reduced so much as to be comparatively trifling. The team work required when using a burning pit is very little more than is required by the old method. Logs and stumps can be hauled to the burning pit for a distance of about 30 to 40 rods, and it is still a long way cheaper by this method.

Underdraining.

When the logging is completed, and all the small roots that can be taken out by a team are taken out, it is time to complete the underdrains. Lay two 4 x 6-inch (or 3 x 5-inch) rails six feet long on edge at the bottom of the ditch and cover with a six-foot board; (start with a three-foot board so as to break joint with the rails), lay them neatly and make them fit. If the rails are inclined to fall in towards each other, drive in a small peg (of cedar) to hold them in place; long before the peg rots out (if it ever does), the rails will have bedded themselves and will not move. On the top of the boards lay all the cedar chips, slivers and odds and ends, and then fill in, taking care to fill in the top soil first and the stiffer clay on the top—the drain will draw better this way.

Always start to put in your cedar at the upper end of the drain and work down towards the outlet; never have an open drain running into an underdrain, and never, if it can be avoided, dig an underdrain to run into a drain already covered and filled in, as it will very likely result in getting the part already covered blocked. The best time of the year to fill in the underdrains is late in the fall, as by that time there will usually be a little trickle of water in the ditch which will give a grade and show if the fall is even. It will probably be found necessary to clean the ditch out as you go along, starting at the top end. The grade of the ditch should have an even fall on the bottom; never have any sags in it, except in the case of drinking places.

Underdrains will not draw well over 40 rods in length unless they are open at both ends, and it is not always easy or desirable to have them open at the top end; so to get over the difficulty it is a good plan to have drinking places along the ditch, say every ten or fifteen chains, beginning five chains from the top. The ditch at this point should be deepened about six or eight inches, so as to have the basin always full of water. Put the rails at this point about twelve to fifteen inches apart and make them heavier than the ordinary rails, and cover the drains with heavy two-inch cedar laid crossways, and spiked to the rails (see Fig. 5), leaving about two feet six inches of an opening in the length of the drain.

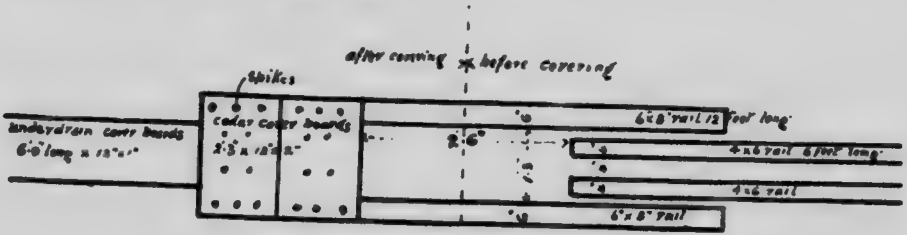

Fig 5 DRINKING PLACE IN DRAIN.

This makes a good drinking place for cattle and helps the drain to draw, and if carefully made it will last a long time and will not fill in. If the field is to be used for hay or grain it will be necessary to set a stout post about six feet high alongside it (the drinking place), so as not to run the horses into the hole when harvesting. It is also as well to get a load of fine gravel and spread it on both sides of the hole. This prevents the cattle from tramping it up.

Stumping.

The last stage of the clearing operations has now been reached, the stumping. The taking out of the last of the smaller second-growth firs, cedars, etc., should be done about four years after they are cut; the longer they are left the easier they will come out, but the big firs and cedars can be safely left until the farm is in a good, profitable state; in other words, this last stage of the stumping should be done out of profits and not out of capital, unless a man has ample means, as the big stumps, unless very thick, do not interfere to any extent with the profitable working of the farm.

In taking out the big fir stumps a fairly liberal use of powder (either 20 per cent. stumping powder, 40 per cent. dynamite, or Judson powder) is essential. All three kinds of powder have their supporters, and experience alone can decide which is the best, as it depends a great deal upon the degree of soundness of the stump, the character of the soil and the way the stump lies; but for all round use, either 20 per cent. stumping or Improved Judson will probably be found most satisfactory.

Powder always acts better if the stump is fairly sound; it is sometimes sufficient to put in a small charge to split it up and then start a fire in it. This reduces the fragments to a size that can easily be handled with a team, and they can then be hauled away to the "burning pit." In burning either stumps or logs it should be remembered that so long as two pieces of wood are either touching or within an inch or two of each other the fire will not go out, but will burn continuously until everything is burnt up, but if they get four inches apart the fire will gradually die, so that one should always try and pile up the logs and roots so that as they burn they will fall towards each other. Careful piling saves a lot of extra work afterwards. As a rule, however, it is much better in blasting the stumps to use enough powder to take the whole stump clean out at one blast, as whatever is left in after the blast has, as a rule, to be dug out; both time and money are saved by careful use of the powder, and by not stinting its use. Do not dig around a stump you are going to blast, or expose any roots. The idea is in blasting out a stump to blast the earth underneath the stump, as this lifts the whole thing out together. It makes a much bigger hole, but it is a good deal easier to fill a hole in than to dig a stump out. This refers to almost all fir stumps, and to the solid cedar stumps, but would not refer to the hollow cedar stumps. These have to be dug or pulled out with teams and blocks and tackle, with the aid of an occasional small blast. It is impossible to give anything more than very general hints as regards the blasting of these big stumps, as experience and the means you have at command will decide the system of work. It can safely be said, however, that the cost of getting them out, if the work is intelligently and systematically done, is, as a rule, very much less than has been generally supposed.

The tools required are a 1-inch auger about three feet long; a 2-inch auger about four feet long, and a 4-inch auger about five feet long. A post-hole auger with a 6-inch bit is also useful for the larger stumps.

Remember always to get the hole as deep as possible under the stump. The greater the depth at which the explosion disturbs the soil the more likely it is that all the roots will come out at one blast. This is always the thing to be aimed for, as if the stump does not come out at the first blast, as it blows the soil out and bares the roots, it is usually impossible to get a satisfactory blast again, and the roots will have to be chopped or cut with a small piece of 40 per cent. dynamite inserted in a 1-inch auger hole. This latter takes longer than chopping, but sometimes the roots are in such a position that it is impossible to chop them without spending a lot of time in digging. With a little experience it will be found that most of the big roots will come out entirely at the first blast, and as a rule the blast will not only lift the stump out but will also split it into two or more pieces.

So far the taking out of the big stumps only has been referred to, but as regards the second growth stumps, the largest of which will not exceed 2 feet

6 inches in diameter (and very few of that size), these must be got rid of before the land can be ploughed to advantage.

The smaller ones can be got out most cheaply by uncovering one or two of the main roots, chopping them off below the surface of the ground, and a team will then pull them out. But where they are over eighteen inches or two feet in diameter, the best way is to put an auger hole three or four feet deep right under the centre of the stump, avoiding the roots if possible, and using sufficient powder to lift up the whole stump. Be sure and make the hole deep enough, the deeper the better. When these stumps are once out they are not too large for a team to handle conveniently, and they should be hauled away to the burning pit. About one pound of powder to each foot in diameter of the stump is usually enough in clay ground, but in sandy or gravelly ground about 50 per cent. more is required. A newly cut stump would probably want double the amount of powder.

After the timber has been cut four years, most of the stumps, twelve to eighteen inches in diameter, will be sufficiently rotten to be easily taken out with grab-hooks or chain and team, without the use of powder at all, and very little chopping or digging.

The stumps of deciduous trees, such as alder, maple, etc., etc., will, in four years' time, or even less, be so rotten that stumping operations of any kind will hardly be needed, as most of them will plough out and the biggest can easily be pulled out with a team.

In the case of anyone not used to handling powder, it is best to get the assistance of an experienced man for a few days. In the winter the powder, if in sticks, is frozen, and it is necessary to thaw it. Do not do this before a fire or on the kitchen stove; leave it in a sunny place for an hour or so. During hot weather in the summer keep it in a shady place, and at all times keep it in a dry place.

Cost of Clearing.

The various operations of clearing have been described in such detail that, at first sight, it will appear to be a very much bigger and more expensive undertaking than it is in reality. Leaving out the cost of taking out the big stumps, which is not essential and is usually considered a "frilling," it is astonishing how small the cost actually is. The bulk of the work is done by the farmer himself, in spare time between seeding and harvest, or in winter. He also, in many cases, makes a profit on the cord-wood, or, at least, good wages; the same also in cutting up logs for shingle-bolts, and, besides which, the farm becomes remunerative as pasture land after the first year.

The fencing and firewood cost nothing but the labour of cutting them, and at the same time the land is being cleared. Again, on most farms there is sufficient cedar to put up all the smaller farm buildings, sheds, etc., and often enough to help out in the larger buildings.

The writer has cleared over two hundred acres of average bush land during the last ten years, and he has found that the chopping, burning, branding up, seeding, and cutting ferns, on the average bush land, can be done by contract for about $15 an acre; the chopping and branding being let in two separate contracts and the rest of the work done by the day. The highest price paid for chopping was $8.50 per acre, and a great deal of it as low as $5 and $6 an acre.

The logging and stumping can be done to the best advantage, as a rule, by day work. The cost will vary from $25 to $35 per acre, or $50 per acre in all, ready for the plough. Of course, the owner puts his own time into this in the way of looking after the work and arranging contracts and so on. It must not be inferred that all bush land can be cleared for this sum; a great deal of it would cost far more, but there are very large areas that can be cleared for this, and a good deal for very much less. This price of $50 would, of course, not apply to land where the heavy timber had to be burnt, but only to land at such a distance from a cord-wood or shingle-bolt market that the heavier timber can be got rid of at little or no cost.

Big cedar stumps can usually be taken out by contract at from $1.50 to $2.50 per stump, but where powder has to be used, as in the case of fir stumps, it is difficult to make satisfactory contracts. It is needless to say that if the various operations of clearing were done by the farmer himself, they should be done for less than figures mentioned above.

In estimating these costs no account is taken of the underdraining, as on the average timber land there is so little of it required. Where there is any considerable amount the cost, as a rule, is far more than offset by there being much less stumping to do.

This land clearing, though not costly, is a rather slow business at first, but the farmer has the satisfaction of seeing his farm gradually grow from the forest to the field; he feels that he himself has made all these rough places smooth, and although taking out the big stumps is usually the work left to the last, there is no part of the clearing operations so thoroughly satisfactory. This is the finishing touch; the stump once out is out forever.

No doubt there will be many old hands at land clearing who will think of the number of ways they could do it better, and others again who would say that it would be impossible to follow out exactly the instructions given. The system outlined is by no means perfect, and is only intended as a general guide to the beginner, and no doubt in practice some variations might be necessary; but the amateur of to-day is the expert of to-morrow, and experience will, without question, suggest many improvements. The cost, however, if the work is done systematically, is nowhere near what is generally supposed.

May, 1906.

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VICTORIA, B. C.:
Printed by RICHARD WOLFENDEN, I.S.O., V.D., Printer to the King's Most Excellent Majesty.
1907.